APPENDIX B
MITIGATION MEASURES, MONITORING AND REPORTING PROGRAM FOR THE 2005 FISHERIES RESTORATION GRANT PROGRAM

# MITIGATION

## I. AESTHETICS

No specific mitigation measures are required to protect aesthetics.

## II. AGRICULTURE RESOURCES

No specific mitigation measures are required to protect agricultural resources.

## III. AIR QUALITY

No specific mitigation measures are required to protect air quality.

## IV. BIOLOGICAL RESOURCES

### General Measures for Protection of Biological Resources

1) Timing. To avoid impacts to aquatic habitat the activities carried out in the restoration program typically occur during the summer dry season.

   a) Work around streams is restricted to the period of June 15 through November 1 or the first rainfall. This is to take advantage of low stream flow and avoid the spawning and egg/alevin incubation period of salmon and steelhead.

   b) Upslope work generally occurs during the same period as stream work. Road decommissioning and other sediment reduction activities are dependent on soil moisture content. Upslope projects do not have seasonal restrictions in the Incidental Take Statement but work may be restricted at some sites to allow soils to dry out adequately. In some areas equipment access and effectiveness is constrained by wet conditions.

   c) The permissible work window for individual work sites will be further constrained as necessary to avoid the nesting or breeding seasons of birds and terrestrial animals. At most sites with potential for raptor (including northern spotted owls) and migratory bird nesting, if work is conditioned to start after July 31, potential impacts will be avoided and no surveys will be required. For work sites that might contain nesting marbled murrelets, the starting date will be September 15 in the absence of surveys. The work window at individual work sites could be advanced if surveys determine that nesting birds will not be impacted.

d) For restoration work that could affect swallow nesting habitat (such as removal of culverts showing evidence of past swallow nesting), construction will occur after August 31 to avoid the swallow nesting period. Alternatively, the suitable bridge nesting habitat will be netted before initiation of the breeding season to prevent nesting. Netting must be installed before any nesting activity begins, generally prior to March 1. Swallows must be excluded from areas where construction activities cause nest damage or abandonment.

e) Planting of seedlings shall begin after December 1, or when sufficient rainfall has occurred to ensure the best chance of survival of the seedlings, but in no case after April 1.

2) During all activities at project work sites, all trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris shall be removed from work areas.

3) Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, will be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the stream channel or adjacent to the stream, will be positioned over drip-pans. Vehicles will be moved out of the normal high water area of the stream prior to refueling and lubricating. The contractor shall ensure that contamination of habitat does not occur during such operations. Prior to the onset of work, DFG shall ensure that the contractor has prepared a plan to allow a prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

4) The contractor shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

5) The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the restoration action.

6) Any equipment work within the stream channel shall be performed in isolation from the flowing stream. If there is any flow when the work is done, the contractor shall construct coffer dams upstream and downstream of the excavation site and divert all flow from upstream of the upstream dam to downstream of the downstream dam. The coffer dams may be constructed with clean river gravel or sand bags, and may be sealed with sheet plastic.

Sand bags and any sheet plastic shall be removed from the stream upon project completion. Clean river gravel may be left in the stream, but the coffer dams must be breached to return the stream flow to its natural channel.

7) For minor actions, where the disturbance to construct coffer dams to isolate the work site would be greater than to complete the action (for example, placement of a single boulder cluster), then measures will be put in place immediately downstream of the work site to capture suspended sediment. This may include installation of silt catchment fences across the stream, or placement of a filter berm of clean river gravel. Silt fences and other non-native materials will be removed from the stream following completion of the activity. Gravel berms may be left in place after breaching, provided they do not impede the stream flow.

8) Any equipment entering the active stream (for example, in the process of installing a coffer dam) shall be preceded by an individual on foot to displace wildlife and prevent them from being crushed.

9) If any wildlife is encountered during the course of construction, said wildlife shall be allowed to leave the construction area unharmed, and shall be flushed, hazed, or herded in a safe direction away from the project site.

10) Any red tree vole nests encountered at a work site will be flagged and avoided during construction.

11) For any work sites containing western pond turtles, foothill yellow-legged frogs or tailed frogs, the contractor shall provide to the DFG contract manager for review and approval, a list of the exclusion measures that will be used at their work site to prevent take or injury to any individual pond turtles or frogs that could occur on the site. The contractor shall ensure that the approved exclusion measures are in place prior to construction. Any turtles or frogs found within the exclusion zone shall be moved to a safe location upstream or downstream of the work site, prior to construction.

12) All habitat improvements shall be done in accordance with techniques in the *California Salmonid Stream Habitat Restoration Manual*. The most current version of the manual is available at: http://www.dfg.ca.gov/habitats.

## Specific Measures for Endangered, Rare, or Threatened Species That Could Occur at Specific Work Sites

Rare Plants

The work sites for the 2005 grants projects are within the range of a variety of rare plant species. The plant species found on a State or Federal special status list that might be associated with the 2005 grants projects, was determined from a search of DFG's Natural Diversity Database. Because of the large number of widely scattered work sites proposed, it is not feasible to survey individual work sites in advance and still be able to implement the restoration projects, due to time limits on the availability of restoration funds. Lists of special status plant species that might occur at individual work sites are presented in Appendix A. Past experience with grants projects from previous years has shown that the potential for adverse impacts on rare plants at salmonid restoration work sites is very low. Few sites surveyed for rare plants between 1999 and 2004 were found to have rare plant colonies; disturbance of rare plants was avoided in all cases. In order to avoid impacts to rare plants during the 2005 grants projects, the following mitigation measures will be implemented:

1) DFG will survey all work sites for rare plants prior to any ground disturbing activities. Rare plant surveys will be conducted following the "Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities" (DFG, 2000). These guidelines are available on the web at: http://www.dfg.ca.gov/hcpb/species/stds_gdl/survmonitr.shtml.

2) If any special status plant species are identified at a work site, DFG will require one or more of the following protective measures to be implemented before work can proceed:

   a) Fencing to prevent accidental disturbance of rare plants during construction,

   b) On-site monitoring by a qualified biologist during construction to assure that rare plants are not disturbed, and

   c) Redesign of proposed work to avoid disturbance of rare plants.

3) If it becomes impossible to implement the project at a work site without potentially significant impacts to rare plants, then activity at that work site will be discontinued.

4) DFG shall ensure that the contractor or responsible party is aware of these site-specific conditions, and will inspect the work site before, during, and after completion of the action item.

California freshwater shrimp (*Syncaris pacifica*)

Of the 111 work sites proposed as part of the 2005 grants program, 19 occur within the range of California freshwater shrimp (CFS) (Redwood Cr. Sediment Control -Mt. Tamalpais State Park Kent Canyon and Deer Park Roads, Dry Creek Bank Stabilization Project #1, Rutherford Dust Society Arundo Removal, Adobe Cr. Restoration Project, Calabazas Cr. Pool Enhancement Modifications, Dutch Bill Creek Coho Habitat Improvement, Green Valley Cr. Coho Enhancement II, Green Valley-Grub Cr. Culvert Retrofits, Middle Wine Cr. Habitat Improvement-Schlumberge, Osmosis Bank Stabilization, Pena Cr. Instream Restoration at Tevendale 2004, Redwood Cr.-Beringer 2004, Redwood Creek Cr. 2005 Beringer Adaptive Watershed Project, Salmon Cr. Mackie II, Salmon Cr. School Bank Stabilization, Sonoma Cr. Stream Bank Stabilization and Pool Enhancement, Stuhmuller Bioengineering, Upper Mark West Cr. Sediment Reduction, Willow Cr. Road Erosion Control Phase II) (Appendix A).

The range of the CFS includes Marin, Napa, and Sonoma counties, excluding the Gualala River watershed. Thirteen of these projects (Redwood Cr. Sediment Control -Mt. Tamalpais State Park Kent Canyon and Deer Park Roads, Dry Creek Bank Stabilization Project #1, Rutherford Dust Society Arundo Removal, Adobe Cr. Restoration Project, Calabazas Cr. Pool Enhancement Modifications, Dutch Bill Creek Coho Habitat Improvement, Middle Wine Cr. Habitat Improvement-Schlumberge, Pena Cr. Instream Restoration at Tevendale 2004, Redwood Cr.-Beringer 2004, Redwood Creek Cr. 2005 Beringer Adaptive Watershed Project, Stuhmuller Bioengineering, Upper Mark West Cr. Sediment Reduction, Willow Cr. Road Erosion Control Phase II) have no potential to impact CFS because they involve no instream work and/or no known occurrences have been identified within the watersheds. Based on the nature of the habitat at the other 6 sites, and their location in their watersheds, it is possible that CFS could occur at those sites. Therefore, the potential for impacts to CFS will be mitigated by complying with all of the mandatory terms and conditions associated with incidental take authorized by the U. S. Fish and Wildlife Service, Biological Opinion dated August 17, 2004. DFG proposes to implement the following measures to minimize adverse effects to the CFS and its habitat:

Where appropriate, a Service-approved DFG biologist will survey each site for shrimp before allowing work to proceed and prior to issuance of a Streambed Alteration Agreement. All overhanging vegetation, undercut banks, and tree roots will be surveyed with a butterfly net or fish net. In site locations where shrimp are present, DFG will require the contractor to implement the mitigation measures listed:

1) Equipment work will be performed only in riffle, shallow run, or dry habitats, avoiding low velocity pool and run habitats occupied by shrimp, unless shrimp are relocated according to the protocol described below. "Shallow" run habitat is defined as a run with a maximum water depth, at any point, less

than 12 inches, and without undercut banks or vegetation overhanging into the water.

2) Hand placement of logs or rocks will be permitted in pool or run habitat in stream reaches where shrimp are known to be present only if the placement will not adversely affect shrimp or their habitat.

3) Care shall be taken during placement or movement of materials in the stream to prevent any damage to undercut stream banks and to minimize damage to any streamside vegetation. Streamside vegetation overhanging into pools or runs shall not be modified.

4) No log or rock weirs (including vortex rock weirs), or check dams shall be constructed that would span the full width of the low flow stream channel. Vegetation shall be incorporated with any structures involving rocks or logs to enhance migration potential for shrimp.

5) DFG must be notified at least one week in advance of the date on which work will start in the stream, so that a qualified DFG biologist can monitor activities at the work site. All work in the stream shall be stopped immediately if it is determined by DFG that the work has the potential to adversely impact on the shrimp or its habitat. Work shall not recommence until DFG is satisfied that there will be no impact on the shrimp.

6) At least 15 days prior to the onset of activities, DFG will submit the name(s) and credentials of biologists who will conduct activities specified in the following measures. The contractor will implement any additional conservation measures requested by DFG and/or the Service.

7) If in the opinion of the Service-approved biologist, adverse affects to shrimp would be further minimized by moving shrimp away from the project site, the following procedure shall be used:

    a) A second survey will be conducted within 24 hours of any construction activity and relocated. Shrimp will be moved while in the net, or placed in buckets containing stream water and then moved directly to the nearest suitable habitat. Stress and temperature monitoring of shrimp shall be performed by the Service-approved biologist. Numbers of shrimp and any mortalities or injuries must be identified and recorded. Shrimp habitat is defined as reaches in low elevation (less than 116m) and low gradient (less than 1 percent) streams where banks are structurally diverse with undercut banks, exposed fine root systems, overhanging woody debris or overhanging vegetation.

b) When no other habitat exists on a landowner's property, the shrimp shall be held in suitable containers with site water and released at the end of the day. Containers shall be placed in the shade.

c) Only Service-approved biologists shall participate in the capture, handling, and monitoring of shrimp. DFG will report annually on the number of capture, release and injuries/mortality and agrees to modify capture/release strategy with Service staff as needed to prevent adverse effects.

d) If moving the shrimp out of the work area cannot be accomplished, and other avoidance measures have been deemed inappropriate, the DFG will drop activities at the work site from the project.

e) Before any construction activities begin at a work site that may contain shrimp, the Service-approved DFG biologist shall conduct a training session for all construction personnel. At a minimum the training shall include a description of the shrimp and its habitat, the importance of the shrimp and its habitat, the general measures that are being implemented to conserve the shrimp as they relate to the work site, and the work site boundaries where construction may occur.

8) At any work site that may contain shrimp, all fueling and maintenance of vehicles, other equipment and staging areas shall occur at least 65 feet from any riparian habitat or water body. The contractor shall ensure contamination of habitat does not occur during such operations. Prior to the onset of work, DFG shall ensure that the contractor has prepared a plan to allow a prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

9) A Service-approved DFG biologist shall be present at the work site until such time as all removal of shrimp, instruction of workers, and habitat disturbance associated with the restoration project have been completed. The Service-approved biologist shall have the authority to halt any action that might result in the loss of any shrimp or its habitat. If work is stopped, the Service-approved biologist shall immediately notify DFG and the Service.

10) Ground disturbing activities in potential shrimp habitat shall be restricted to the period between July 1 and November 1.

11) If a work site is temporarily dewatered by pumping, intakes shall be completely screened with wire mesh no larger than 0.2 inch to prevent shrimp from entering the pump system. Water shall be released or pumped downstream, at an appropriate rate, to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow

shall be removed in a manner that would allow flow with the least disturbance to the substrate.

12) Service-approved biologist shall permanently remove from within the project work site, any individuals of exotic species, such as bullfrogs, centrarchid fishes, and non-native crayfish, to the maximum extent possible. The contractor shall have the responsibility that such removals are done in compliance with the California Department of Fish and Game Code.

13) Invasive non-native vegetation that provides shrimp habitat and is removed as a result of Program activities shall be replaced with native vegetation that provides comparable habitat for the shrimp. Revegetated sites shall be irrigated as necessary until vegetation is established. Revegetated sites shall be monitored until shading and cover achieves 80 % of pre-project shading and cover and for a minimum of 5 years.

14) No dumping of dead trees, yard waste or brush shall occur in shrimp streams, which may result in oxygen depletion of aquatic systems.

Coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*Oncorhynchus tshawytscha*), Steelhead (*Oncorhynchus mykiss*), and Coast cutthroat trout (*Oncorhynchus clarki clarki*)

While all of the work proposed under this program will enhance habitat for one or more of these species, 96 of the 111 work sites proposed as part of the 2004 grants program will involve instream work in their habitat (Appendix A). In order to avoid any potential for negative impacts to these species the following measures will be implemented:

1) Project work within the wetted stream shall be limited to the period between June 15 and November 1, or the first significant fall rainfall. This is to take advantage of low stream flows and to avoid the spawning and egg/alevin incubation period of salmon and steelhead. Whenever possible, the work period at individual sites shall be further limited to entirely avoid periods when salmonids are present (for example, in a seasonal creek, work will be confined to the period when the stream is dry).

2) No heavy equipment shall operate in the live stream, except as may be necessary to construct coffer dams to divert stream flow and isolate the work site.

3) Work must be performed in isolation from the flowing stream. If there is any flow when the work is done, the operator shall construct coffer dams upstream and downstream of the excavation site and divert all flow from upstream of the upstream dam to downstream of the downstream dam. The coffer dams may be constructed with clean river gravel or sand bags, and

may be sealed with sheet plastic. Sand bags and any sheet plastic shall be removed from the stream upon project completion. Clean river gravel may be left in the stream, but the coffer dams must be breached to return the stream flow to its natural channel.

4) For minor actions, where the disturbance to construct coffer dams to isolate the work site would be greater than to complete the action (for example, placement of a single boulder cluster), measures will be put in place immediately downstream of the work site to capture suspended sediment. This may include installation of silt catchment fences across the stream, or placement of a filter berm of clean river gravel. Silt fences and other non-native materials will be removed from the stream following completion of the activity. Gravel berms may be left in place after breaching, provided they do not impede the stream flow.

5) If it is necessary to divert flow around the work site, either by pump or by gravity flow, the suction end of the intake pipe shall be fitted with fish screens meeting DFG and NMFS criteria to prevent entrainment or impingement of small fish. Any turbid water pumped from the work site itself to maintain it in a dewatered state shall be disposed of in an upland location where it will not drain directly into any stream channel.

6) Any disturbed banks shall be fully restored upon completion of construction. Revegetation shall be done using native species. Planting techniques can include seed casting, hydroseeding, or live planting methods using the techniques in Part XI of the *California Salmonid Stream Habitat Restoration Manual*.

7) Suitable large woody debris removed from fish passage barriers that is not used for habitat enhancement, shall be left within the riparian zone so as to provide a source for future recruitment of wood into the stream.

8) Measures shall be taken to minimize harm and mortality to listed salmonids resulting from fish relocation and dewatering activities:

   a) Fish relocation and dewatering activities shall only occur between June 15 and November 1 of each year.

   b) DFG shall minimize the amount of wetted stream channel that is dewatered at each individual project site to the fullest extent possible.

   c) All electrofishing shall be performed by a qualified fisheries biologist and conducted according to the National Marine Fisheries Service *Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act*, June 2000.

9) If for some reason these mitigation measures cannot be implemented, or the project actions proposed at a specific work site cannot be modified to prevent or avoid potential impacts to anadromous salmonids or their habitat, then activity at that work site will be discontinued.

California red-legged frog (*Rana aurora draytonii*)

Twelve of the work sites proposed as part of the 2005 grants program are within potential habitat for the California red-legged frogs (CRLF) (Appendix A). Activities proposed for the 12 sites (Dry Cr. Bank Project #1, Rutherford Dust Society Arundo Removal, Walters Cr. Riparian Phase II, Bear Gulch Watershed Plan, Arroyo Hondo Culvert Project, Gaviota State Park Roads Repair, Gobernador Cr. Removal and Modification of Barriers 3 &4, Santa Ynez Bank & Riparian, Calabazas Cr. Pool Enhancement Modifications, Salmon Cr. Mackie II, Sonoma Cr. Stream Bank Stabilization & Pool Enhancement, Lion Cr. Bank Stabilization Project) will not remove or degrade CRLF habitat; however, precautions will be required at this site to avoid the potential for take of CRLF while using heavy equipment at these sites. The potential for impacts to CRLF will be mitigated by complying with all of the mandatory terms and conditions associated with incidental take authorized by the U. S. Fish and Wildlife Service, Biological Opinion dated August 17, 2004 and August 13, 2004. DFG proposes to implement the following measures to minimize adverse effects to the CRLF and its habitat:

1) At least 15 days prior to the onset of activities, the DFG will submit the names(s) and credentials of biologists who would conduct activities specified in the following measures. No project activities will begin until the DFG has received written approval from the Service that the biologist(s) is qualified to conduct the work.

2) A Service-approved biologist will survey the work site at least two weeks before the onset of activities. If red-legged frogs are found in the project area and these individuals are likely to be killed or injured by work activities, the Service-approved biologist will allow sufficient time to move them from the site before work activities resume. Only Service-approved biologists will participate in activities with the capture, handling, and monitoring of red-legged frogs.

3) Before any construction activities begin on a project, a Service-approved biologist will conduct a training session for all construction personnel. At a minimum, the training shall include a description of the red-legged frog and its habitat, the importance of the red-legged frog and its habitat, the general measures that are being implemented to conserve the red-legged frog as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books and briefings may be used in the training session, provided that a qualified person is on hand to answer any questions.

4) A Service-approved biologist shall be present at the work site until such time as removal of red-legged frogs, instruction of workers, and habitat disturbance has been completed. The Service-approved biologist shall have the authority to halt any action that might result in impacts that exceed the

levels anticipated by the Corps and Service during review of the proposed action. If work is stopped, the Corps and the Service shall be notified immediately by the Service-approved biologist or on-site biological monitor.

5) During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.

6) All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 65 feet from any riparian habitat or water body. The Corps and the DFG will ensure contamination of habitat does not occur during such operations. Prior to the onset of work, the DFG will ensure that the contractor has prepared a plan to allow a prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

7) A Service-approved biologist will ensure that the spread or introduction of invasive exotic plant species is avoided to the maximum extent possible. Areas disturbed by project activities will be restored and planted with native plants.

8) The number of access routes, number and size of staging areas, and the total area of the activity will be limited to the minimum necessary to achieve the project goal. Routes and boundaries will be clearly demarcated.

9) Ground disturbing activities in potential red-legged frog habitat will be restricted to the period between July 1 and October 15.

10) To control erosion during and after project implementation, DFG will implement best management practices, as identified by the appropriate Regional Water Quality Control Board.

11) If a work site is to be temporarily dewatered by pumping, intakes will be completely screened with wire mesh not larger than 0.2 inch to prevent red-legged frogs from entering the pump system. Water will be released or pumped downstream at an appropriate rate to maintain down stream flows during construction activities and reduce the creation of ponded water. Upon completion of construction activities, any barriers to flow will be removed in a manner that would allow flow to resume with the lease disturbance to the substrate.

12) A Service-approved biologist will permanently remove from the project area, any individuals of exotic species, such as bullfrogs (*Rana catesbiana),* centrarchid fishes, and non-native crayfish to the maximum extent possible.

The biologist will have the responsibility to ensure that their activities are in compliance with the Fish and Game Code.

13) Prior to the onset of any project-related activities, the approved biologist must identify appropriate areas to receive red-legged frog adults and tadpoles from the project areas. These areas must be in proximity to the capture site, contain suitable habitat, not be affected by project activities, and be free of exotic predatory species (ie., bullfrogs, crayfish) to the best of the approved biologist's knowledge.

14) If red-legged frogs are found and these individuals are likely to be killed or injured by work activities, the Service-approved biologists must be allowed sufficient time to move them from the site before work activities resume. The Service-approved biologist must relocate the red-legged frogs the shortest distance possible to one of the predetermined areas. The Service-approved biologist must maintain detailed records of any individuals that are moved (eg., size, coloration, any distinguishing features, photographs (digital preferred) to assist in determining whether translocated animals are returning to the point of capture. Only red-legged frogs that are at risk of injury or death by project activities may be moved.

15) Biologists who handle red-legged frogs must ensure that their activities do not transmit diseases. To ensure that diseases are not conveyed between work sites by the Service-approved biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force must be followed at all times.

Least Bell's Vireo (*Vireo bellii pusillus*)

Of the 111 work sites proposed as part of the 2004 grants program, none could potentially affect suitable habitat for the Least Bell's Vireo (Appendix A). None of the activities proposed for these sites will significantly degrade existing vireo habitat, but the potential exists for the noise from heavy equipment work and the harvesting of willow branches for revegetation at these sites to disrupt vireo nesting. To avoid this potential impact, the following mitigation measures will be implemented:

1) Work shall not begin within one quarter mile of any site with known or potential habitat for the Least Bell's Vireo until after September 15.

2) Harvest of willow branches at any site with potential habitat for the Least Bell's Vireo will not occur between March 1 and September 15.

3) The work window at individual work sites may be modified, if protocol surveys determine that nesting birds do not occur within 0.25 miles of the site during the breeding season.

4) The DFG shall ensure that the contractor or responsible party is aware of this site-specific condition, and will inspect the work site before, during, and after completion of the action item.

5) If for some reason these mitigation measures cannot be implemented or the project actions proposed at a specific work site cannot be modified to prevent or avoid potential impacts to Least Bell's Vireo or their habitat, then activity at that work site will be discontinued.

Marbled murrelet (*Brachyrampus marmoratus*)

The marbled murrelet is listed as endangered under CESA and threatened under ESA. Activities to protect and restore habitat will not remove or degrade suitable habitat for marbled murrelets, however nesting birds could be disturbed by the noise from heavy equipment required for projects such as culvert removal or placement of large woody debris.

Of the 111 work sites proposed as part of the 2005 grants program, 16 are in potentially suitable habitat for the marbled murrelet (Bummer Spurs Watershed Rehabilitation, Lower Terwer Cr. Riparian Restoration, Mynot Cr. Instream Habitat Restoration, Salt Cr. Riparian Habitat Enhancement, Wilson Cr. Instream Habitat Enhancement, Yonkers Cr. Fish Passage Barrier Removal, Chadd Cr. 101 Culvert Passage, Maple Creek Cover Enhancement, Mid-Mattole Coho Recovery, Paine Riparian, Redwood Creek Road O-3 PCFWWRA/319, Rex's Wing Dam Phase III, YES Group Water Board Roads Project, Wilson Creek Crossing, Usal Cr. Channel Restoration, Bear Gulch Watershed Plan) (Appendix A). None of the activities proposed for these sites will remove, degrade, or downgrade suitable marbled murrelet habitat. Direct injury or mortality is not an issue. The potential exists for noise from heavy equipment work at these sites to disrupt marbled murrelet nesting. To avoid this potential impact, the following mitigation measures will be implemented:

1) Adverse effects can be avoided by limiting heavy equipment work within 0.25 mile of marbled murrelet habitat to the period between September 16 and March 23.

2) Work shall not begin within 0.25 mile of any site with occupied or un-surveyed suitable marbled murrelet habitat between March 24 and September 15.

3) The work window at individual work sites near suitable habitat may be modified, if protocol surveys determine that habitat quality is low and occupancy is very unlikely.

4) If for some reason these mitigation measures cannot be implemented or the project actions proposed at a specific work site cannot be modified to prevent or avoid potential adverse effects to marbled murrelet or their habitat, then activity at that work site will be discontinued.

Northern spotted owl (*Strix occidentalis caurina*)

The northern spotted owl is listed as threatened under ESA. Restoration activities should not alter habitat for northern spotted owls, however nesting birds could be disturbed by the noise from heavy equipment during projects such as culvert removal or placement of large woody debris. Disturbance can be avoided by limiting heavy equipment work within 0.25 miles of suitable spotted owl habitat to the period between August 1 and January 31.

Of the 111 work sites proposed as part of the 2005 grants program, 40 are in potentially suitable habitat for the northern spotted owl (Appendix A). None of the activities will remove, degrade or downgrade spotted owl habitat. Direct injury or mortality of owls is not an issue. The potential exists for heavy equipment work at these sites to disturb spotted owl nesting. To avoid this potential effect, the following mitigation measures will be implemented:

1) Work at any site within 0.25 miles of suitable habitat for the northern spotted owl will not occur from February 1 to July 31.

2) The work window at individual work sites may be advanced prior to July 31, if protocol surveys determine that suitable habitat is unoccupied.

3) If for some reason these mitigation measures cannot be implemented or the project actions proposed at a specific work site cannot be modified to prevent or avoid potential impacts to northern spotted owls or their habitat, then activity at that work site will be discontinued and CDFG will reinitiate consultation with FWS.

Willow flycatcher (*Empidonax traillii*),

Of the 111 work sites proposed as part of the 2005 grants program, 2 could potentially affect suitable habitat for the willow flycatcher by the harvesting of willow branches for riparian planting and construction of live willow mattresses and live willow walls (Salmon Creek Watershed Stream Bank Stabilization and Habitat Restoration, Santa Ynez River Bank and Riparian Restoration) (Appendix A). None of the activities proposed for these sites will significantly degrade existing willow flycatcher habitat, but the potential exists for the noise from heavy equipment work or harvesting of revegetation material at these sites to disrupt willow flycatcher nesting. To avoid this potential impact, the following mitigation measures will be implemented:

1) Heavy equipment work shall not begin within one quarter mile of any site with known or potential habitat for the willow flycatcher until after August 31. Heavy equipment work shall not begin within one quarter mile of any site with known or potential habitat for the southwestern willow flycatcher until after September 15.

2) Harvest of willow branches at any site with potential habitat for the willow flycatcher will not occur between May 1 and August 31. Harvest of willow branches at any site with potential habitat for the southwestern willow flycatcher will not occur between May 1 and September 15.

3) The work window at individual work sites may be modified, if protocol surveys determine that nesting birds do not occur within 0.25 miles of the site during the breeding season.

4) No more than 1/3 of any willow plant shall be harvested annually. Care shall be taken during harvest not to trample or over harvest the willow sources.

5) DFG shall ensure that the contractor or responsible party is aware of this site-specific condition, and will inspect the work site before, during, and after completion of the action item.

6) If for some reason these mitigation measures cannot be implemented or the project actions proposed at a specific work site cannot be modified to prevent or avoid potential impacts to willow flycatcher or their habitat, then activity at that work site will be discontinued.

Point Arena mountain beaver (*Aplodontia rufa nigra*)

Of the 111 projects proposed as part of the 2005 grants program, none occur within the range of the Point Arena mountain beaver (PAMB) (Appendix A). Of those projects, 111 have no potential to adversely affect PAMB because no work will occur in any habitat used by PAMB. The other one project within the range of the PAMB, (Garcia River-Lower Mainstem Bank Stabilization), has the potential to adversely impact PAMB because work will occur in or near habitats potentially used by PAMB. To avoid potential impacts to PAMB from these projects, the following mitigation measures will be implemented:

1) Qualified DFG personnel will survey each work site for PAMB. Qualification of surveyors, survey protocols, and reporting will conform to USFWS's *Draft Guidelines for Project-Related Habitat Assessments and Surveys for Point Arena Mountain Beaver.* Per the *Guidelines*, if the activity status of a burrow is in doubt, or if there is un-surveyed potential habitat, PAMB active presence will be assumed.

2) For work sites where PAMB active presence is confirmed or assumed, all protective measures prescribed by USFWS's *Draft Point Arena Mountain Beaver Standard Protection Measures for No-Take Determinations* will be followed, through issuance of a Streambed Alteration Agreement and/or directives to the contractor by the DFG Contract Manager. The protective measures most pertinent to DFG salmonid habitat improvement projects include:

   a) No operation of noise generating equipment (e.g. chainsaws) within 100 feet of active burrows during the breeding season (December 15 – June 30).

   b) No operation of mechanical equipment (e.g backhoes, excavators) within 100 feet of active burrows during the breeding season (December 15 – June 30), and within 50 feet the remainder of the year.

   c) No ground disturbance (e.g. dumping of boulders) within 500 feet of active burrows during breeding season, and within 100 feet the remainder of the year. No severe ground disturbance (e.g. driving of bridge piles, blasting) within 500 feet of active burrows at any time.

   d) No habitat modification (e.g. vegetation removal) within 400 feet of active burrows.

   e) No vegetation modification or removal, or construction of permanent barriers (e.g. fences) at any location or time that may disrupt dispersal or movement of PAMB.

   f) No vehicular or foot traffic within 25 feet of active burrows, and no alteration of water drainage or hydrology in active burrow areas.

3) DFG will require that the Contract Manager must be notified at least one week in advance of the date on which work will start, so that a qualified DFG biologist can monitor activities at the work site. If the necessary protective measures cannot be implemented at a work site, then no work at the site will occur.

## V. CULTURAL RESOURCES

Ground-disturbance will be required to implement the project at some work sites that have the potential to affect cultural resources. This potential impact will be avoided through implementation of the following mitigation measures:

1) DFG will contract with a qualified archaeologist(s) to complete cultural resource surveys at any sites with the potential to be impacted prior to any

ground-disturbing activities. Cultural resource surveys will be conducted using standard protocols.

2) If cultural resource sites are identified at a site, DFG will require one or more of the following protective measures to be implemented before work can proceed: a) Fencing to prevent accidental disturbance of cultural resources during construction, b) on-site monitoring by a cultural resource professional during construction to assure that cultural resources are not disturbed, c) redesign of proposed work to avoid disturbance of cultural resources.

3) DFG shall report any previously unknown historic or archeological remains discovered at a site to the U. S. Army Corps of Engineers as required in the Regional General Permit.

4) If it becomes impossible to implement the project at a work site without disturbing cultural resources, then activity at that work site will be discontinued.

5) DFG shall ensure that the contractor or responsible party is aware of these site-specific conditions, and will inspect the work site before, during, and after completion of the action item.

## VI. GEOLOGY AND SOILS

There is no potential for a significant adverse impact to geology and soils; implementation of the restoration project will contribute to an overall reduction in erosion and sedimentation. Existing roads will be used to access work sites. Ground disturbance at most work sites will be minimal, except for road improvements or decommissioning. Road improvements and decommissioning will involve moving large quantities of soil from road fills and stream crossings to restore historic land surface profiles and prevent chronic erosion and sediment delivery to streams. In order to avoid temporary increases in surface erosion, the following mitigation measures will be implemented:

1) DFG will implement the following measures to minimize harm to listed salmonids resulting from culvert replacement activities and other instream construction work:

   a) All stream crossing replacement or modification designs, involving fish passage, must be visually reviewed and authorized by NOAA Fisheries (or DFG) engineers prior to commencement of work.

   b) If the stream in the project location was not passable to, or was not utilized by all life stages of, all covered salmonids prior to the existence of the road crossing, the project shall pass the life stages and covered salmonid species that historically did pass there. Retrofit culverts shall meet the fish

passage criteria for the passage needs of the listed species and life stages historically passing through the site prior to the existence of the road crossing.

c) Effective erosion control measures shall be in-place at all times during construction. Construction within the 5-year flood plain will not begin until all temporary erosion controls (eg., straw bales or silt fences that are effectively keyed-in) are in-place down slope of project activities within the riparian area. Erosion control measures shall be maintained throughout the construction period. If continued erosion is likely to occur after construction is completed, then appropriate erosion prevention measures shall be implemented and maintained until erosion has subsided.

d) Sediment shall be removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they shall be staked and dug into the ground 6 inches. Catch basins shall be maintained so that no more than 6 inches of sediment depth accumulates within traps or sumps.

e) Sediment-laden water created by construction activity shall be filtered before it leaves the right-of-way or enters the stream network or an aquatic resource area. Silt fences or other detention methods shall be installed as close as possible to culvert outlets to reduce the amount of sediment entering aquatic systems.

f) Upon project completion, all exposed soil present in and around the project site shall be stabilized within 7 days.

2) DFG will implement the following measures to minimize harm to listed salmonids resulting from construction in the riparian corridor:

a) Retain as many trees and brush as feasible, emphasizing shade producing and bank stabilizing trees and brush.

b) Use project designs and access points that minimize riparian disturbance without affecting less stable areas, which may increase the risk of channel instability.

c) Minimize compaction by using equipment that either has (relative to other equipment available) less pressure per square inch on the ground or a greater reach, thus resulting in less compaction or less area overall compacted or disturbed.

d) At the completion of the project, soil compaction that is not an integral element of the design of a crossing should be de-compacted.

e) Disturbed and compacted areas shall be revegetated with native plant species. The species used should be specific to the project vicinity or the region of the state where the project is located, and comprise a diverse community structure (plantings should include both woody and herbaceous species). Plant at a ratio of two plantings to one removed plant.

f) Unless otherwise specified, the standard for success is 80 percent survival of plantings or 80 percent ground cover for broadcast planting of seed after a period of 3 years.

g) The spread or introduction of invasive exotic plants will be avoided to the maximum extent possible.

3) DFG will implement the following measures to minimize harm to listed salmonids resulting from road decommissioning activities:

a) Woody debris will be concentrated on finished slopes adjacent to stream crossings to reduce surface erosion; contribute to amounts of organic debris in the soil; encourage fungi; provide immediate cover for small terrestrial species; and to speed recovery of native forest vegetation.

b) Work sites will be winterized at the end of each day when significant rains are forecast that may cause unfinished excavations to erode. Winterization procedures shall supervised by a professional trained in erosion control techniques and involve taking necessary measures to minimize erosion on unfinished work surfaces. Winterization includes the following: smoothing unfinished surfaces to allow water to freely drain across them without concentration or ponding; compacting unfinished surfaces where concentrated runoff may flow with an excavator bucket or similar tool, to minimize surface erosion and the formation of rills; and installation of culverts, silt fences, and other erosion control devices where necessary to convey concentrated water across unfinished surfaces, and trap exposed sediment before it leave the work site.

c) Adequate erosion control supplies (gravel, straw bales, shovels, etc.) shall be kept at all restoration sites to ensure sediment is kept out of water bodies.

d) Mulching and seeding is required on all exposed soil which may deliver sediment to a stream.

## VII. HAZARDS AND HAZARDOUS MATERIALS

The project will not create a significant hazard to the public or the environment. At work sites requiring the use of heavy equipment, there is a

small risk of an accident upsetting the machine and releasing fuel, oil, and coolant, or of an accidental spark from equipment igniting a fire. The potential for these impacts will be reduced to a less than significant level through implementation of the following mitigation measures:

1) The contractor shall have dependable radio or phone communication on-site to be able to report any accidents or fire that might occur.

2) Heavy equipment that will be used in these activities will be in good condition and will be inspected for leakage of coolant and petroleum products and repaired, if necessary, before work is started.

3) Work with heavy equipment will be performed in isolation from flowing water, except as may be necessary to construct coffer dams to divert stream flow and isolate the work site.

4) All equipment operators will be trained in the procedures to be taken should an accident occur. Prior to the onset of work, DFG shall ensure that the contractor has prepared a plan to allow a prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

5) All activities performed in or near a stream will have absorbent materials designed for spill containment and cleanup at the activity site for use in case of an accidental spill.

6) All fueling and maintenance of vehicles and other equipment shall be located at least 20 meters from any riparian habitat or water body. The contractor shall ensure contamination of habitat does not occur during such operations.

7) Location of staging/storage areas for equipment, materials, fuels, lubricants, and solvents, will be located outside of the stream's high water channel and associated riparian area. The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the restoration action. To avoid contamination of habitat during restoration activities, trash will be contained, removed and disposed of throughout the project.

8) Stationary equipment such as motors, pumps, generators, compressors, and welders, located within the dry portion of the stream channel or adjacent to the stream, will be positioned over drip-pans.

9) All internal combustion engines shall be fitted with spark arrestors.

10) The contractor shall have an appropriate fire extinguisher(s) and fire fighting tools (shovel and axe at a minimum) present at all times when there is a risk of fire.

11) Vehicles shall not be parked in tall grass or any other location where heat from the exhaust system could ignite a fire.

12) The contractor shall follow any additional rules the landowner has for fire prevention.

The potential for mercury contamination is largely predicted by the presence of historic hydraulic gold mines and mercury (cinnabar) mines (California's Abandoned Mines: A Report on the Magnitude and Scope of the Issue in the State, DOC 2000). Therefore, only a few limited areas within the geographic scope of this grant program have any potential for gravels contaminated with elemental mercury, they are: Middle Klamath River, Salmon River, Scott River, and the Lower Middle and Upper Trinity River. (Though studies by the USGS failed to find significant levels of methyl mercury near these mines.) The only other mercury mine contamination within the FRGP-area is in Marin County (Walker Creek), and this contamination is not in instream gravels or dredger tailings, instead it is from the bedrock; and therefore, not easily methylized, and not as bio-available.

Given the limited geographical potential for encountering mercury contamination (from historic mining) within the geographic scope, and the limited number of projects within these areas that will either disturb the channel bottom or import gravels for instream restoration; the following avoidance and mitigation measures will be adhered to:

1) Any gravel imported from offsite will be from a source known to not contain historic hydraulic gold mine tailings, dredger tailings, or mercury mine waste or tailings.

2) For work which will disturb the channel bottom (grading and channel dredging) in areas that had historic hydraulic gold mining, or historic mercury mining (as outlined above), pre and post-project testing of macro invertebrate will be done. This testing will consist of:

   a) Prior to project implementation, a mercury bio-assessment of macro-invertebrates expressed as total mercury in mg/g of macro-invertebrates tissue will be done. Macro-invertebrate samples will be collected directly upstream and downstream of the project site, in accordance with methods described in the December 2003 *California Stream Bio-assessment Procedure* and May 7, 2003 laboratory protocol entitled *Mercury in Tissue* (FIMS Mercury Rev. 3).

b) The results of the pre-project mercury bio-assessment will be reported to the appropriate RWQCB(s) at least 30 days prior to project initiation. If mercury is detected, the project may proceed only with RWQCB concurrence. If the Executive Officer has not disapproved the project within 30 days of receipt of DFG's report, the project may proceed under this certification.

c) Immediately following implementation of the project, and for one additional season thereafter (ie., two sampling events), complementary mercury bio-assessment of macro-invertebrates (total mercury/mg) will be done directly upstream and downstream of the project site. The results of the post-project monitoring will be reported in DFG's Annual Reports.

## VIII. HYDROLOGY AND WATER QUALITY

1) Work shall be conducted during the period of lowest flow.

2) Work shall be performed in isolation from flowing water. If there is any flow when the work is done, the contractor shall construct coffer dams upstream and downstream of the excavation site and divert all flow from upstream of the upstream dam to downstream of the downstream dam. The coffer dams may be constructed with clean river gravel or sand bags, and may be sealed with sheet plastic. Sand bags and any sheet plastic shall be removed from the stream upon project completion. Clean river gravel may be left in the stream, but the coffer dams must be breached to return the stream flow to its natural channel.

3) For minor actions, where the disturbance to construct coffer dams to isolate the work site would be greater than to complete the action (for example, placement of a single boulder cluster), then measures will be put in place immediately downstream of the work site to capture suspended sediment. This may include installation of silt catchment fences across the stream, or placement of filter berm of clean river gravel. Silt fences and other non-native materials will be removed from the stream following completion of the activity. Gravel berms may be left in place after breaching, provided they do not impede the stream flow.

4) Before work is allowed to proceed at a site, DFG will inspect the site to assure that turbidity control measures are in place.

## X. MINERAL RESOURCES

No specific mitigation measures are required for mineral resources.

### XI. NOISE

Personnel shall wear hearing protection while operating or working near noisy equipment (producing noise levels ≥85 db, including chain saws, excavators and back hoes).

### XII. POPULATION AND HOUSING

No specific mitigation measures are required for population and housing.

### XIII. PUBLIC SERVICES

No specific mitigation measures are required for public services.

### XIV. RECREATION

No specific mitigation measures are required for recreation.

### XV. TRANSPORTATION/TRAFFIC

The project will not affect transportation/traffic, because erosion control and culvert replacement projects will occur in wildland/rural sites with very little use. There is a potential that culvert replacement at some work sites could temporarily interfere with emergency access. This potential impact will be avoided through implementation of the following mitigation measure at any sites where emergency access might be necessary:

1) During excavation for culvert replacement, the contractor shall provide a route for traffic around or through the construction site.

### XVI. UTILITIES AND SERVICE SYSTEMS

No specific mitigation measures are required for utilities and service systems.

## MONITORING AND REPORTING

1) DFG Contract Manager will inspect the work site before, during, and after completion of the action item, to ensure that all necessary mitigation measures to avoid impacts are properly implemented.

2) DFG shall perform implementation monitoring on all completed restoration activities annually, as described in the *California Coastal Salmonid*

*Restoration Monitoring and Evaluation Program* or the latest version of the *California Salmonid Stream Habitat Restoration Manual*, Part VIII. DFG will submit a copy of the final report, no later than March 1 annually to NOAA Fisheries.

3) DFG shall perform effectiveness and validation monitoring on 10 percent annually of completed restoration projects as described in the *California Coastal Salmonid Restoration Monitoring and Evaluation Program* or the latest version of the *California Salmonid Stream Habitat Restoration Manual*, Part VIII. DFG will submit a copy of the final report, no later than March 1 annually to NOAA Fisheries.

4) An annual report shall be submitted to NOAA Fisheries by March 1 of each year, which provides a summary of all restoration action items completed during the previous year. The annual report shall include a summary of the specific type and location of each project, stratified by individual project, 4th field HUC and ESU. The report shall include the following project-specific summaries, stratified at the individual project, 4th field Huc and ESU level:

   a) A summary detailing fish relocation activities, including the number and species of fish relocated and the number and species injured or killed.

   b) The number and type of instream structures implemented within the stream channel.

   c) The length of stream bank (feet) stabilized or planted with riparian species.

   d) The number of culverts replaced or repaired, including the number of miles or restored access to unoccupied salmonid habitat.

   e) The distance (miles) of road decommissioned.

   f) The distance (feet) of aquatic habitat disturbed at each project site.

5) DFG and NOAA Fisheries staff will meet annually to coordinate on monitoring requirements. The purpose of the meeting is to facilitate prioritization of ongoing, proposed, and future monitoring efforts, and ensure these efforts meet the requirements of the biological opinion and are achievable.

6) For Alameda, Contra Costa, Lake, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties, DFG must submit an annual report due by January 31 of each year of implemented projects to the US Fish and Wildlife Service Office, 2800 Cottage Way, Sacramento, California 95825. The report must include:

a) A table documenting the number of California freshwater shrimp or red-legged frogs killed, injured, and handled during each Program project that utilizes the Corps authorization.

b) A summary of how the terms and conditions of this biological opinion and the protective measures by the Corps and DFG worked.

c) Any suggestions of how these measures could be revised to improve conservation of this species while facilitating compliance with the Act.

7) For Monterey, San Benito, San Luis Obispo, and Santa Cruz counties, DFG must submit an annual report due by January 31 of each year of implemented projects to the US Fish and Wildlife Service Office, 2493 Portola Road, Suite B, Ventura, California 93003. The report must include:

a) A table documenting the number of red-legged frogs killed, injured, and handled during each Program project that utilizes the Corps authorization.

b) A summary of how the terms and conditions of this biological opinion and the protective measures by the Corps and DFG worked.

c) Any suggestions of how these measures could be revised to improve conservation of this species while facilitating compliance with the Act.

8) DFG will submit annual reports on July 1 of each year to the 401 Program Managers of the State Water Resources Control Board and the appropriate RWQCB(s) documenting work undertaken during the preceding year and identifying for all such work the following:

a) Project name and grant number;

b) Project purpose and summary work description;

c) Name(s) of affected water body(ies);

d) Latitude/longitude in decimal degrees to at least four decimals;;

e) Type(s) of receiving water body(ies);

f) For each water body type affected, the quantity of waters of the U.S. temporarily and permanently impacted. Fill/excavation discharges shall be reported in acres and fill/excavations discharges for channels, shorelines, riparian corridors, and other linear habitat shall also be reported in linear feet;

g) Actual construction start and end-dates;

h) Whether the project is on-going or completed.

9) DFG shall report any previously unknown historic or archeological remains discovered at a site to the U. S. Army Corps of Engineers as required in the anticipated Regional General Permit.

# APPENDIX C

## Guidelines for Conducting Project Specific Endangered, Rare and Threatened Species Surveys

This appendix sets forth survey protocols described more specifically in the Department of Fish and Game (DFG), "Environmental Services Field Manual," 1996. For more individual species details, survey protocols are available on the web at: http://www.dfg.ca.gov/hcpb/species/stds_gdl/survmonitr.shtml.

Surveys conducted to assess the potential for individual activities to affect endangered, rare, or threatened species, should address all species as designated by the Fish and Game Commission and as defined by the California Environmental Quality Act guidelines (see Cal. Code Regs., title 14, § 15380 [CEQA Guidelines definition of "endangered, rare, or threatened species"]).

A biological field survey must be conducted for each major action item to assess the potential for impact on endangered, rare or threatened species that might be affected by activity at a work site when:

a. The action item may alter habitat of an endangered, rare, or threatened species;

b. Endangered, rare, or threatened species have historically been identified in the area of the project activity, but recent surveys have not been done; or suitable but unoccupied habitat exists; or

c. A biological survey has never been conducted and it is unknown whether endangered, rare, or threatened species or their habitat exist at the project site or project impact area.

Biological consultants should be selected on the basis of possession of the following qualifications (in order of importance):

a. Field investigator experience in field sampling design and field methods;

b. Taxonomic experience and knowledge of species ecology;

c. Familiarity with the species of the area including endangered and threatened species; and

d. Familiarity with the appropriate State and Federal statutes related to collecting.

Field surveys should be conducted in a manner designed to locate any endangered, rare, or threatened species or their habitat that may be present. Specifically, surveys should be:

a. Conducted at the time of year when endangered, rare, or threatened species are both evident and identifiable. Field surveys should be scheduled to coincide with the appropriate breeding or other life history stage of animals when they are likely to be evident, or with peak flowering periods and/or during periods of phenological development that are necessary to identify a plant species of concern.

b. Biological. Predictive surveys (which predict the occurrence of species based on the occurrence of habitat or other physical features, rather than by actual field inspection) should not be used as the sole method for impact assessment. Every species noted in the field should be identified to the extent necessary to determine whether it is threatened or endangered.

c. Conducted in a manner that is consistent with protection of the species. Collections of listed, candidate, or rare species must be in accordance with applicable State and Federal permit regulations (collection of State-listed species requires a permit or memorandum of understanding with DFG; collection of Federally-listed species may require a Federal permit.) Collections will be permitted only when such actions are necessary for species identification and/or would not jeopardize the continued existence of the population. For plant identification, photography should be used to document identity and habitat whenever possible, but especially when the population cannot withstand collection of voucher specimens.

d. Conducted using appropriate field techniques in all habitats of the site to ensure a reasonably thorough coverage of potential impact areas. Techniques may be prescribed as part of the State and Federal permits authorizing such activities.

e. Well-documented. When an endangered or threatened species is located, a California Native Species (or Natural Community) Field Survey Form, or equivalent written form, should be completed and submitted to the Wildlife and Habitat Data Analysis Branch (DFG, 1416 Ninth Street, Room 1225, Sacramento, California 95814) for inclusion in the Natural Diversity Data Base.

Field survey reports, when required, shall be provided to DFG by the grant recipient and should contain the following information:

a. Project description including a detailed map of the project location and study area.

b. A written description of biological setting, including a vegetation map.

c. Detailed description of survey methodology.

d. Dates of field surveys.

e. Results of surveys, including detailed maps, the occurrence of threatened and endangered species and other important wildlife, or natural communities and habitats.

f. An assessment of potential impacts.

g. Discussion of the relative importance of the project to threatened or endangered species with consideration of nearby or induced developments, species occurrences, and statewide distribution.

h. Recommended measures to avoid jeopardizing endangered or threatened species.

i. List of all species identified.

j. Copies of all California Native Species Field Survey Forms or Natural Community Field Survey forms.

k. Name of field investigator(s).

l. References cited, permits held, persons contacted, museums visited, and location of all specimens.